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Annual Announcement of the Medical Department of the University of the State of Missouri, Volume 10, 1854-1855

AN

INTRODUCTORY ADDRESS,

Delivered at the

BEGINNING OF THE SESSION OF 1855-'56,

by

JOHN T. HODGEN, M. D.,

Professor of General and Special Anatomy,

in the

MEDICAL DEPARTMENT OF THE UNIVERSITY OF THE STATE OF MISSOURI.

NOVEMBER, 1855.

ST. LOUIS, MO.

PRINTED AT THE MISSOURI REPUBLICAN BOOK AND JOB OFFICE.

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St. Louis, Nov. 12th, 1855.

Prof. Hodgen:

At a meeting of the Students of the Medical Department, Missouri University, of the Session of 1855-'56, C.C. Strother in the Chair, and L. L. Bedell, Secretary, the undersigned Committee were instructed to request a copy of your Introductory Lecture for publication.

Very respectfully yours,

ROBERT STEWART,
GEO. IRWIN, Committee.
L. L. BEDELL,

Prof. J.T. Hodgen.

St. Louis, Nov. 14th, 1855.

Gentlemen of the Medical Class:

Your request, through your Committee, has been received and I most cheerfully conform to your desires, with the earnest hope, that the facts set forth, and the deductions drawn therefrom, may be the means of turning your attention to the consideration of the relations borne by the organic world to the inorganic.

Respectfully,

JOHN T. HODGEN.

ROBT. STEWART,
GEO. IRWIN, Committee.
LUCIAN L. BEDELL,

A D D R E S S.

Ladies and Gentlemen:

It will be no part of my object, this evening, to attempt to detail to you the many advantages possessed by the city of St. Louis, over every other, as a site of medical learning, nor to speak of the peculiar advantages to be found at the Medical Department of the University of Missouri.

Neither will I attempt to portray the many trials and anxieties suffered by the father of this Institution, who, sixteen years ago, landed in St. Louis, alike penniless and friendless; and, how, after years of unremitting toil, he has fixed in the hearts of the people of the Valley of the Mississippi, a reputation as enduring as it is elevated.

Neither are we assembled this evening, to express, in sighs and tears, our sense of the loss which the Medical Profession and the public have suffered in the death of our respected and admired Dr. Deming.

He departed in the ripeness of years, at the close of an arduous and useful winter's toil; and a pang of sorrow went to the hearts of all who knew him.

He is gone,---let him quietly rest---for there will be found no tongue vile enough to speak a slanderous word of him. The wounds inflicted by his death on our hearts are still fresh and bleeding; and I am unwilling to pain his friends farther by fixing more deeply in their minds the recollection of the death of so great and so good a man.

But, Ladies and Gentlemen, I wish to speak of Science. Not to laud it, not to notice its influence on the arts of civilized life, not to point to the high destiny of the scientific world; but to attempt to set forth a new thought, or to give well known facts a new bearing.

The various phenomena of life have thus far been enveloped in mystery. We know that we live, but we cannot tell why. We know of what we are composed, and we know of how much; but the reason why our organization is the result of the combination of certain elements, in certain proportions, has never been explained to us; neither do I propose to make this explanation. Would that I were able to do so.

But I wish to offer a new thought, a new theory, in regard to the organization of the bodies of animal and vegetable forms. That is, that organization and crystalization are both the result of the natural, healthy working of the same force, only on different materials.

I wish to show that we need not envelop, in more mystery, the organizing than the crystalizing force. And to show that the peculiarity of form set forth in the various organic and inorganic masses on Earth, is not dependent on any extraneous force, but simply that they assume a peculiar form in conformity to the laws written by an All-wise Power in the elements themselves.

That the form assumed by the atoms entering into the structure of the human body, is as natural to them as

the crystaline form is to the elements of the salt of which they are composed. And farther, that the manifestations of life are but the bringing to light of some of the properties belonging to organized matter, which, prior to the action which set them free, were dormant.

We find in the elements entering into the formation of an animal, a series of changes going on, which are regarded as the expressions of a force, which, in the absence of a more convenient term, has been called vital; and giving rise to what are known as vital phenomena.

That is, a series of changes corresponding to chemical actions, yet in very many instances modified or influenced by the vital force.

We may combine the necessary elements in proper proportions to make fibrine, albumen, or any of the proximate elements of an animal body. Yet we cannot, by chemical or any other agency, so arrange these elements as to form these compounds. It does not require a vast amount of scientific knowledge to teach us that chemistry dictates to us the proper proportions of the different elements entering into the various structures of animal, as well as vegetable forms. And, by its aid, we may collect, proportion and combine the elements necessary to the formation of a simple organized cell of muscular, osseous or nervous tissue. Yet it requires the plastic arranging energy of the vital force to give the atoms that position, one toward another, necessary to the formation of any of these structures.

We speak in terms of exultation of the force which causes an element of any compound to forsake its original connexions, and seek a new combination and a new existence. We speak of the nicety, the beauty, and the certainty of this action. But where shall we find language through which to express our thoughts in relation to the mysterious and wonderful power which takes these compounds, and, as by magic influence,weaves them into various structures, such as nerve, bone, and muscle?

And if at this we stand amazed, to what extent must our feeling of wonder be excited to see the same force, with the certainty of a workman much skilled, forming an eye to see, an ear to hear, and a tongue to taste?

In order to the performance of these things, all must admit the existence and the action of a force superior to chemical affinity.

Whilst many think it extremely ridiculous to attribute so much to the action of a force, of the laws of which we know so little, none can deny the existence of that force--- none deny that there are laws which govern its action.

The existence of the force has, indeed, been long acknowledged, and it is humiliating to know that we are so little acquainted with the laws by which it is governed, or in conformity to which it acts.

This is the strongest possible reason for attempting, as I now do, to show that there is one universal law, belonging alike to inorganic and organic matter; and by so doing we shall progress at least one step in the development of a knowledge of a law as universal as it is mysterious and incomprehensible, with our present knowledge of it.

Before the days of the immortal Newton, mankind were conscious of the existence and action of a force which caused a stone to fall to the Earth, and were aware that

"'Tis that which forms the starting tear
And bids it trickle from its source;
'Tis that which holds the Earth a sphere,
And guides the comet in its course."

Whilst it was reserved for that great philosopher to discover and demonstrate the laws that govern the actions of this all-pervading, ever acting power. So, too, it will be the good fortune of some one now living, or yet to live, to discover the laws of that force which acts in the formation, and ceases to act in the destruction, of animal and vegetable forms.

Then it will be known how and why the elements, absorbed by the roots, and assimilated by the leaves of plants, go to form, some the bark, some the woody fibre, and some to give tint to the blushing flower.

Bichat has said, that life is the aggregate of those functions by which death is resisted. It is doubtless true that life is the result of the action of a force, which so controls chemical affinities, as to lead them to the evolution of phenomena as various as the tissues and organs through which our senses may be impressed with the existence and action of more than chemical force; that is, of the existence of the phenomena of life. It is chemical action, brought to bear upon structures that exhibit physical phenomena.

We find the same chemical forces acting in building up and sustaining an organism during life, that we find conspiring to cause a dissolution of its particles after death.

Carbonized blood comes to the lungs by the vessels, oxygen by the mucus channels, and carbonic acid is formed and set free by the union of precisely the same elements, and in the same proportions here, as when the proper elements are brought into contact outside of the body, and, of course, not influenced by the vital force.

So, too, we find chemical attractions and repulsions going on in all the tissues of the body, guided only by such laws as we see controling the action of the same, or other elements, outside of the organism.

But, as the organism is so arranged, that, instead of allowing the changes to go on without the production of anything more than may be observed in the contact of metallic plates with an acid, we find that the various phenomena of life are developed as perfectly, as beautifully, and as certainly as a galvanic current is produced and recognized by the proper arrangement of machinery, through which our senses may recognize its existence.

We must then admit that, during life, the laws governing chemical actions act as perfectly, as freely and as forcibly as when the organization ceases to manifest the existence of life, and dissolves itself in the surrounding elements.

The conclusion is then just, that life does not consist alone in the manifestations presented by chemical affinities admitted to free play, but that the vital principle or force, or that which causes, not the ultimate elements forming a

body to unite with each other, but that which causes the particles to take a proper place in reference to each other; so that, instead of forming amorphous masses, (as they would do if just thrown together,) they form organs and tissues, for the performance of the various functions of the body; that it is this force which is active in giving the proximate elements their proper positions one toward another.

A concentrated solution of any crystalizable substance, when placed under favorable circumstances, will deposit crystals of a certain definite fixed form, that form never varying in the slightest degree in the same substance.

Now, this is not the result of the action of chemical force, but it is the result of the action of a force which arranges the particles of the substance, but does not and cannot alter the chemical constitution of the compound.

So true, indeed, is this force to its result, that if a crystal of alum be formed, and a part is afterwards broken off, and the crystal is then replaced in the solution in which it was formed, it will be so perfectly repaired that the point of fracture could never be discovered.

A reparation is here effected which so nearly resembles that which takes place in some of the lower orders of animals, that the scientific observer is at once forced to the conclusion that the power which repairs the crystal in the one case, is similar to, if not identical with, that which replaces the lost limb in the other.

Who would be bold enough in this age to say, that this is a manifestation of vital force in the crystal? No one has done it so far, and it is to be apprehended that many a long and weary year must pass before the scientific world will acknowledge that the same force that gives form, gives definite surfaces, and gives a definite number of angles to crystal, also builds the mighty oak, bids the starting grass to pierce the earth in spring, gives claws to crabs, and hands, and ears, and eyes and brain to man.

But stranger things have occurred; and am I doomed to be called visionary if I should say that the day will come when this will be the popular doctrine--when this will be understood, and taught, and believed to be true?

The forms of crystals have been said, by our chemical philosophers, to be the result of the force of cohesion; that it is cohesive force which causes the particles to assume a peculiar position, one towards another, and develops the crystaline form in the mass.

But this theory I am not willing to admit; for, if cohesion produces crystalization, then it must increase the number of points of contact between the particles entering into the formation of the crystal; and, if there are more points of contact between the particles forming a mass of crystals than when the substance was in its amorphous form, the crystal would be more difficult to break than the amorphous body. Now,if this be true, I would ask, why are the axles of railroad cars, which, from long agitation, have become crystaline, so liable to be broken, whilst, in their original condition, they are not.

From our railroad tracks the blood of more than a thousand victims tells us that axles which have become crystaline are dangerous.

It is true that cohesion only acts in holding particles

together when those particles are in actual contact. Now, if the particles are already in contact, cohesion could not make that contact more immediate, and those particles that are not in actual contact could not be brought into contact by a force which only acts when bodies are actually touching each other; so that the force which arranges the particles in crystalization must be some other than cohesion.

The statement that the cohesive and crystaline forces are the same, would lead us to the conclusion that the more perfectly the particles of matter were arranged by the crystaline alias cohesive force, the more firmly would those particles adhere to each other; and the more perfectly the axles of railroad cars are crystalized, the more difficult would it be to break them.

That cohesion holds the particles of matter together, no one will deny; but that it does, or can have, any influence in arranging those particles, any one can see, at a glance, is not the case.

There are two forces active in developing and maintaining a body in form: first, the formative force, and secondly, cohesion; and they are separate, distinct and independent forces.

In the development of animal and vegetable forms, we find precisely the same forces acting that we observe to be active in the formation of crystals; that is, that there must first be a power to arrange, which may be called formative; and next, that which holds each particle to its place, cohesion.

The action of these two forces is beautifully illustrated when we place a particle of oil in contact with a small portion of albuminous matter; the albumen immediately envelops the oil and forms a perfect analogue of a true organized cell.

Now, the formative force draws the albumen over the oil, and gives each its appropriate position; the oil within and the albumen without, whilst cohesion only serves to keep them in their proper places.

We find the elements necessary to the formation of the muscular, osseous, fibrous, and other tissues, flowing in continuous streams through the vessels and permeating every structure of the body. Yet, the elements of which muscle may be formed are not deposited in bone, nor are the particles belonging to nerve deposited in the hair or nails. The formative force only takes up such elements as are proper for the development of every tissue, allowing the other elements to pass on and be appropriated in the development of other structures.

Now, that power which causes each element to be deposited in its proper place is not the same as that which changes the chemical constituents of the tissue, but it is an energy inherent in the particles, which points out to each its appropriate place and forces it into it.

There is no contention about which shall be first or which shall be last, or what belongs to muscle, or what goes to nerve, or what forms bone; for the law that governs each is written in it, and that law is eternal, unchanging and ever active as that chemical force which unites the ultimate elements to form

the particle, or that cohesive force which retains them in their positions. This will be appropriately illustrated by the example of albumen and fibrine, for these are chemically precisely the same, and the difference between them is said to depend on the position which the particles assume toward each other. That is, chemistry detects no difference, yet the formative force finds one much better adapted to its purposes than the other.

Chemical force might resolve marble into its original elements, and some of those elements might be made to enter into the composition of other bodies; but chemical force could never place blocks of marble so as to form a church, a state house, or a monument; and cohesion, though it held them eternally in their places, resisting the ravages of heat and cold, of wind and rain, does not and could not assist in giving each block its proper place, so that the whole should exhibit that symmetry which is regarded as being so essential to works of that character.

We are told again, that there is a difference in the action of the crystaline and formative forces known to physiologists; that the one acts in the formation of bodies bounded by plain surfaces, united at definite angles, whilst the other produces rounded, even and other regular forms.

Now, at best, this only appears like a modified action of the same power, for we do not find a greater difference between the cell, formed by the contact of oil and albumen, and a truly organized cell, than between the crystals of salts that are not isomorphous; and, as the difference in the salts causes a difference in the crystals, their angles and surfaces, and the difference in the elements out of which one or another of the tissues may be formed cause a difference in the form of the ultimate structure or cell, so, too, we may presume that the difference between the elements of a salt and the elements of an organized structure may account for the peculiar form that each may assume, though they be developed by the same force.

The conclusion, then, is a natural one, that if the same force, acting on different salts, will form crystals of the first, the fourth, or the sixth class, that, by its action on different materials, such as form muscle, bone and every element of the body, that every tissue of the body may be formed without the aid of any extraneous and mysterious agencies, such as have been imagined to belong peculiarly to the higher orders of created existence.

It will be impossible in the brief time allotted(by a proper consideration of your feelings) for this address, to go into a detailed account of all the facts bearing upon this question; so that I cannot (as I would wish) show to your perfect satisfaction, that the force which gives crystaline form in the inorganic world, also gives to the elements of the organic that arrangement which is necessary for the exhibition of the various phenomena of life.

Yet there are such striking resemblances in the requisites for their development, such a similarity in the processes of their formation, and the development of both are so similarly influenced by light, heat and electricity, and, to some extent, a correspondence in the phenomena presented by each, that the conclusion is so irresistibly forced upon the mind, that a

decent respect for truth will not allow us to suppose them to be the offspring of different forces.

First, of the requisites for the development of crystaline and organized structures:

In order that a crystal, or the parts of vegetable or animal forms may be developed, it is necessary that the elements which go to build them up should be so situated that they may move freely one upon another; either in solution, as the elements of crystals may be in water, those of vegetables in the sap, or those of animals in the fluid serous matter of the blood; or they may be made to move freely, as by jarring or hammering, as iron is crystalized; or in a state of solution in caloric; or as the development of the germ is hastened by turning the egg.

Here , then, are striking resemblances in the essentials necessary for the development of crystals, plants and animals.

Secondly, the similarity of the processes: If a crystalizable salt in solution be so placed that we may view it by the aid of a solar microscope, we will see, first, small floating particles equally, but without order, distributed throughout the solution. These then begin to collect and form larger masses which are irregularly suspended in the fluid. Soon they arrange themselves in wavy lines, then approach each other, and, each being deposited in its proper place, they form a perfectly regular and beautiful crystal.

An amorphous mass is seen in the seeds of plants, and in the eggs of oviparous animals. By the spontaneous movement in the particles, cells are formed and placed, without the slightest order or arrangement, and giving no evidence of the tissues to be formed; next, these cells fall into ranks by the fiat of the formative force,not in every case in the same order, but differing as the elements from which they were formed are seen to differ.

Here, then, is a marked similarity in the processes of development in these three departments--mineral, vegetable, and animal.

Here, then, we have a correspondence in the requisites for the development of crystalized and organized bodies, and a marked similarity in the processes of development.

Thus, corresponding in these important particulars, the most skeptical will not deny these resemblances, whilst the candid investigator of this most intricate subject will seize with avidity upon any thing calculated to simplify and define, not only the vague ideas hitherto entertained of crystalization, but also to give more definite bounds to the heretofore unmeaning term, vitality; whilst it refers many and varied phenomena to a law almost as universal, and quite as true in its action, as gravity itself.

We will now notice the influence of Galvanism, of Heat, and Light on these two processes, and see how nearly they correspond to each other:

The influence of galvanism is well marked in the development of crystals as well as vegetable and animal tissues.

I may here introduce some experiments of a florist of this city, who, in his hot-house, had a great variety of plants. To a dozen of the vessels, containing a part of these, he attached

the opposite poles of galvanic batteries; these he watched carefully, and found that the plants were not only more rapidly developed in other respects, but also that they flowered three weeks earlier than other plants of the same varieties, contained in the same hot -house, which were equally attended in other respects.

Many experiments in physiology, both human and comparative, go to show that the same is the effect of galvanic currents transmitted through a part when the nerves, supplying the same, have been severed from their central connections; that the muscular and other tissues are developed with increased rapidity, or prevented from wasting by this artificial means of stimulation.

Solutions of gold, silver, and other substances, may be made to deposit crystals by passing galvanic currents through them.

Now, as it is assumed, in reference to crystals, that each particle has its poles, which are represented by the termination of three straight lines upon the surface, and that the polar force, or attraction, is increased by the galvanic currents passing through the solution, may we not also argue that the atoms of animal and vegetable tissues are in the same way acted upon by galvanic currents; that is, that it acts as a polarizing force, and thus increases, as it were, the development of the various tissues.

Thus, we see the influence of galvanic currents are the same in promoting the growth of crystaline and organized structures.

The experiments of Reichenbach show conclusively, that there is developed by crystals, also by plants during efflorescence, not only light but heat, both of which are to be observed in darkened rooms by the hands and eyes of sensitive persons.

Gregory states that light is evolved continually both by the bodies of men and those of inferior animals. Here, then, we find the same phenomena presented by those masses that have been termed inorganic, that we observe to be common to those animals that exhibit in their greatest variety the many phenomena of life.

It is a well known fact, that temperature has a marked influence on the development of plants as well as animals; if the amount of heat be too great or too small, the growth is either checked or entirely prevented; such is also the case in crystalization; either excesses of heat or cold prevent this action.

In concluding the consideration of the various influences affecting similarly these two processes, viz., crystalization and organization, light will come in for a small share.

Light manifests not the slightest influence on the growth of crystals, plants or animals, except so far as it acts as a chemical agent. Under its influence, plants absorb and appropriate carbonic acid, and some solutions may be made to deposit crystals by changing the chemical relations which the elements bear to each other; though, in neither case, does it act as a motive force.

The development of the frog may be checked by placing it, whilst in its larvae state, in the dark.

Who has not seen forest trees growing thick and tall, and stretching their heads, and in honorable competition, eagerly

seeking after that essential element of their existence, light?

Who has not noted the pallid hue of death in which plants, growing in dark cellars, are clothed? And, when brought to the light, we see them wearing robes of healthy lively green.

We may frequently observe a delicate exotic, when, by the hand of anxious attention, it has been wrapped in darkness, to preserve it from the scathing blasts of winter, peering out through some chink or cranny, and, in language almost audible, most piteously beg for light.

Thus we see the influence of galvanism, of heat and light, are the same in the organic and inorganic worlds; heat and galvanism promoting crystalization as well as organization, and both act as dynamic agents, whilst light is solely in its action, a chemical agent.

Upon the arguments here feebly presented, I have based the conclusion, that the force which gives crystaline form to those simple and compound substances known as mineral, is the same as that which moulds, in all their beauty and elegance, those elements that go to make up an organism for the manifestation of the varied and beautiful phenomena which are regarded as vital.

And, that the same force that deposits in their appropriate places the particles of crystals, adjusts the elements of the eye to see, the brain to think, and the heart to fill the whole machine with that vital current intended and beautifully adapted to supply each part with the materials for its growth, and for the manifestation of the phenomena peculiar to each.

It is true, then, that the same force which is found active in the production of crystaline forms, also gives each particle of an organized body its place, that the whole may be capable of manifesting life, and that the law which guides in their development is written in the structures themselves.

That all crystaline forms, from the ordinary mica through the various and ever-varying gems up to the peerless diamond, rending, as it does, and beautifully displaying the ultimate elements of rays of light.

That all the vegetable world, from the simple cryptogamic plant, flourishing as a single isolated cell, mid the eternal snows of our polar regions, up through the flowerless and flowering plants to the magnificent cedar and the elevated pines, as they rear their cloud-penetrating heads to gather the first rays of morning sun-light, or to receive the last, the parting kiss, of the blushing god of day.

That, through all animal organisms, from the rude, uncouth, ill-formed, half-made-up and illy-developed molusca, through the invertebrate and vertebrated classes, up to man, exhibiting, as he does, the thousand-varying phases of vital phenomena, we find the self same formative force, with unerring certainty, driving each particle to its proper position, and the same cohesive force binding them there until set free by the dissolving influences of chemical affinities.

It is also true that the structures of organized forms are sacrificed in the production of the phenomena of life, and that chemical action destroys or rather changes the composition of the matter forming each part, and, instead of that dread hour

in which the immortal spirit severs its relation with the body being the point at which alone the form is surrendered to the destructive influences of chemical affinities, not a moment passes which should not teach us the same great lesson, that man dies continually.

Vital phenomena are the result of chemical action, and in proportion to the activity of chemical change will be the vital manifestations; and dust returns to dust, not only in that great hour when the last, black, bitter drop falls from the avenging sword of the angel of death, but, as death claims a part of the organization, life taxes the outer world for matter to supply its place.

Every motion of our bodies causes a separation of some of the atoms forming it; every thought costs something; every pulse of life brings death in its train; so that, literally, "whilst we live we are in the midst of death."

No, the body does not live; it suffers a thousand deaths; each day it dies continually; the spirit alone can live, whilst matter may serve as the humble instrument through which it manifests itself.

Destruction and restoration are continually going on, as long as the body has life in it. So that, instead of life being the "aggregate of those forces by which death is resisted," it is actually that which consigns to death, more rapidly, those elements through which it is manifested.

The living force sacrifices the elements of the physical organization for the development of mechanical force in the laboring man--to develop mind in the student and scholar; and these elements, sacrificed, are but the fuel in the lamps of genius, of the poet and the artist.

One of the great practical questions now occupying the attention of the scientific world, is to ascertain what are those elements of our food which go to build up bone, and sinew and muscle; for these are required on our southern plantations to grow cotton, and rice, and sugar; and, in our northern regions, to raise corn, and wheat, and potatoes. They are required in Europe to carry on the war between that Potentate who would crush the liberties of the world forever, and those Allied Powers that would give liberty of thought and speech, and action to all mankind. And he who first discovers what will best develop these structures, will do more for the development of a great motive force than Watt, who invented the steam engine.

The planter of the South thinks it strange, that his slave cannot work on rice; but, even now, science is ready to say, that very little of the elements necessary to the development of motive force lies dormant in that substance to be set free by the changes going on in man's physical organization.

And though the stomach of the slave were equal in capacity to a washing-tub, and possessed the digestive powers of an ostrich, he could not find more of the elements necessary for the development of force in rice, than would be sufficient to carry its own weight.

Another and analagous inquiry of scientific men has been to ascertain what are those materials necessary to the development of brain. And he who first makes the discovery, and best applies it, will outstrip the inventor of the Magnetic Telegraph as far as the comet, in its eliptic course, outruns and outshines the fire-fly.

Think of it, how great, how grand, how glorious, to learn what food we may take into our stomachs to best develop brain, and thus to ultimate in the production of increased mental vigor.

As motion is the ultimate object, end and effect of that food which goes to develop the muscular structures, so, too, is mind the result of those elements which go to build up and sustain the nervous textures.

And, as he who appropriates most of those elements which go to form muscle will be capable of effecting most, mechanically, so, he who gathers in and appropriates most of those elements which form nervous matter will exhibit most intellectual vigor. The laboring man eats his pork, his beef, and his beans, and is able to sustain great muscular effort; whilst he who takes albuminous matters, containing phosphorous, may light the world with more than a phosphorescent glare. Not that I mean to be understood to say, that the simple taking of these things into the stomach will insure the results spoken of; but that, if they are properly appropriated by the organs themselves, the results will necessarily follow.

Life is dependent on chemical change for its continuance, and that chemical change is dependent on the external world for a supply of the proper materials upon which to act. So that, in proportion to the rapidity of the supply from the external world, and the rapidity of the chemical change, will vital phenomena present themselves.

Nature performs a thousand experiments every day, proving that the phenomena of life are directly connected with chemical action; just as a galvanic current is dependent for its existence upon the chemical action going on between the metallic plates and the acid. Just so are vital phenomena dependent on the chemical changes going on in the vital organs. So that man, and all living, breathing nature, are to be regarded as machines that are dependent on chemical action for their existence, and a peculiar organism for the manifestation of peculiar phenomena; that muscular tissue is beautifully adapted for the production of motion, whilst the nervous generates and conducts nervous influence. And chemical change is always in precisely the same ratio with the phenomena presented by each, and regarded as vital.

So long, then, as the formative force is supplied with the proper materials out of which to mould the peculiar structures of animal forms, so long as chemical affinities force from peculiar organs peculiar phenomena, just so long will life continue.

But, when the proper materials for the development of organs and tissues are withdrawn, and the formative force finds nothing upon which to exercise its power to arrange, then, for the want of proper machinery, chemical force might dissolve the whole structure in the vain attempt to produce vital phenomena.

No heart pulsates at its bidding; no brain becomes

a fountain of glowing thoughts; no eye gathers in the brightness and beauty of surrounding nature; no ear rejoices in the delights of heaven-born melody. But all, all are stilled in death, and the form remains a perishing monument, upon which is written its own sad history.

ANNUAL ANNOUNCEMENT

OF THE

MEDICAL DEPARTMENT,

OF

THE UNIVERSITY

OF

THE STATE OF MISSOURI.

SESSION 1854---55.

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W. D. McCRACKEN, ...	St. Francois county.
ASA ELLIS, ...	Texas county.
R. G. ROBERTS, ...	Cedar county.
GEO. W. HOUGH, ...	Cole county.
JOSEPH CHEW, ...	Ray county.
HENRY SLACK, ...	Buchanan county.
JAS. A. CLARK, ...	Chariton county.
JOHN B. CLARK, ...	Howard county.
JAMES ELLISON, ...	Lewis county.
CHAS. A. HADEN, ...	Greene county.

FACULTY.

JOHN S. MOORE, M. D.,

Professor of the Theory and Practice of Medicine.

JOSEPH N. McDOWELL, M. D.,

Professor of Surgery and Surgical Anatomy, and Dean of the Faculty.

ABNER HOPTON, M. D.,

Professor of Chemistry and Pharmacy.

JOHN BARNES, M. D.,

Professor of Materia Medica, Therapeutics and Medical Botany.

E. DEMING, M. D.,

Professor of Pathology and Clinical Medicine.

JOHN T. HODGEN, M. D.,

Professor of Anatomy—General and Special.

PAYTON SPENCE, M. D.,

Professor of Physiology and Comparative Anatomy.

J. R. ALLEN, M. D.,

Professor of Obstetrics and Diseases of Women and Children.

I. DRAKE McDOWELL, M. D.,

Demonstrator.

CIRCULAR.

The Medical Faculty of the University of the State of Missouri, in issuing their Circular for the present year, cannot but congratulate the Medical profession of the Mississippi Valley upon the great and increasing facilities which the City of St. Louis presents to students of Medicine who are desirous of obtaining a practical as well as a theoretical knowledge of all the Departments of the profession. St. Louis has now a population of over one hundred thousand inhabitants, and its future increase is destined to equal that of the past. But, in addition to this (her permanent resident population,) thousands of emigrants and others yearly come to St. Louis from Europe and all parts of our country. These, together with the resident poor of the city, keep our hospitals filled and our dispensaries thronged with both medical and surgical patients of every grade and character. More abundant and favorable opportunities for the investigation of disease at the bed side, cannot be desired. The same conditions that occasion these important hospital facilities, must of course cause an abundance of anatomical material for the purposes of dissection

Situated, as St. Louis is, upon the Mississippi, midway between its head waters and its mouth, it is of easy access from all the regions bordering upon the Missouri and the Mississippi rivers and their tributaries, from Council Bluffs and Minnesota to the city of New Orleans.

It will be observed, that the Chair of Obstetrics in our school is differently filled for the present year, Prof. B. T. KAVANAUGH having resigned his chair for reasons connected with his business relations in another State.

Prof. J. R. ALLEN, who is well known in the South and West as an able and eloquent teacher, having been connected with the schools of Louisville and Lexington, will fill the vacancy.

The following special facilities for the acquisition of a thorough medical education are presented to the consideration of medical students by the Missouri University:—

City Hospital,

In the charge of Dr. Thomas F. Bannister, resident Physician and Surgeon.

This Institution, for the reception of destitute patients of both sexes and of all ages, was built by the corporate authorities of the city of St.

Louis in the year 1846, and has been liberally sustained by them in successful operation from that time to the present. The present Hospital edifice, is a large and capacious building, 120 feet front by 40 feet deep, capable of holding 150 patients. Owing, however, to the great increase in the population of St. Louis within the last few years, it is now much too small for the accommodation of one-half the patients that seek admittance. The city authorities have therefore commenced an enlargement of the building, making an addition of 120 feet to the front, and running a wing back 160 feet, making an immense structure, three stories and an attic in height; 240 feet in front, with a wing of 160 feet, the whole, when completed, being capable of receiving 400 patients. This addition will be finished by the middle of next October. It will contain a large and commodious lecture-room, capable of seating 500 persons, especially constructed, through the kindness and public spirit of the city authorities, for the accommodation of the medical students who may attend the medical and surgical clinics at the institution. This truly noble institution will, when completed, far surpass any of a similar character in the West, not only on account of the magnificent scale on which it has been projected, but also on account of the liberal provision which has been made to enable the medical students of the West to profit by an actual inspection and practical investigation at the bed-side of the diseases of the Mississippi Valley.

The resident Physician and Surgeon, Dr. BANNISTER, a courteous gentleman, as well as a skilful physician and surgeon, will, the Medical Faculty feel assured, by his kindness and liberality during the past four or five years, continue to do all in his power to promote the comfort of medical students during their attendance upon the clinics at the Hospital.

The Clinics at the City Hospital will be delivered by the Prof. of Surgery and the Prof. of Clinical Medicine.

The following abstract, furnished by Dr. Bannister, will suffice to show the number of patients and the character of the diseases that are admitted into the institution during the year:—

Total number of Admissions,	2040
" " " Surgical Cases. . . .	400
" " " Typhoid and Typhus Fever,	150
" " " Chronic Diarrhœa, . . .	187
" " " Cholera, ...	181
" " " Erysipelas, ...	43
" " " Other Diseases. such as Pneumonia, Pleurisy, Phthisis, Intermittent and Remittent Fever, &c. &c., ...	1079

Students are admitted to the clinics at this institution, free of extra charge.

City Dispensary,

In the charge of the Medical Faculty of the Missouri University.

In the summer of 1852, the City Council of the city of St. Louis passed an ordinance making a liberal appropriation of money for the establishment and support of a Dispensary, to be connected with the Medical Department of the Missouri University. In the fall of the same year this Dispensary was first opened for the reception of patients in the College buildings. From that time to the present, the number of those who daily apply for medical aid has rapidly increased, as will appear from the semi-annual reports of the Dean of the Faculty to the City Council.

All the diseases that prevail in our climate are met with at this Institution.

The number of Patients prescribed for at the Dispensary, during the past year, amounted to near, ...	2500
Number of Surgical Cases, ...	500

Admittance to the clinics at the Dispensary, free of extra charge.

List of Surgical Operations,

Performed before the Class, from the private practice of the Professor of Surgery.

Amputation of the Arm, ...	1
" of the Hand, ...	1
" of the Female Mammæ, . .	2
Operation for Neurosis of Tibia, . . .	1
" for Necrosis of Humerus, . .	1
" for Club Foot, ...	2
" for Cataract, ...	2
" for Strabismus, ...	2
" for Stone in the Bladder, . .	1
" for the relief of Anchylosed Joint,	1
Reduction of Dislocated Ulna, . . .	1
Trephining for Epilepsy, ...	1

Besides a large number of minor operations.
The operations at the Hospital are also performed in the presence of the Class.

Practical Anatomy.

The facilities for obtaining subjects in the city of St. Louis, makes this a point peculiarly inviting to the medical student. The supply of dissecting materials has hitherto been even more than sufficient, and consequently the classes have been furnished with an abundance at a more moderate charge than in most of the schools of our country.

The Dissecting Room is under the charge of the Professor and Demonstrator of Anatomy. It is ample and commodious, having been constructed with especial reference to the health and comfort of the student.

The Demonstrator will be in attendance at the Dissecting Room every night, to see that the classes are supplied with subjects; to give the necessary instructions as to the proper mode of conducting a dissection, and to explain the relative and special anatomy of the parts as they are brought to view by the knife. No labor will be spared in enabling the student to use the scalpel to the full extent of his wishes, and to prosecute his labors with every possible advantage to himself.

The demonstrations of the more important organs, such as the brain, heart, liver, &c., are usually conducted in the Ampitheatre; all the classes being previously notified to attend. By this arrangement, each student is made acquainted not only with what he himself has traced out, but also with what is exposed by the labors of others.

Museums.

The Anatomical Museum, consists of an extensive collection of preparations of the human body, both dry and wet, illustrative of the osseous, the muscular, the vascular, and the nervous system; the viscera, the development of the fœtus, &c. &c. The dry preparations of the vascular and nervous system are numerous, and of the most superior workmanship.

The Museum of Natural History—an immense collection, the fruits of years of persevering toil and labor of its founder, Prof. J. N. McDowell — is worthy of the especial consideration of medical students generally, and particularly of those who are desirous of prosecuting any one or more of the collateral sciences connected with the study of Medicine. The Mineralogy, Geology, Zoology (both living and extinct,) the Antiquities, &c., of our country, are all abundantly illustrated.

Regulations for the Terms of Lectures, &c.

The regular Lectures at this Institution will commence on the 1st of Nov., 1854, and will be continued until the 1st of March, 1855.

From the 1st of October, the Anatomical Rooms will be opened, and will receive the personal attention of the Prof. of Anatomy and the Demonstrator.

During the month of October, preliminary lectures will be delivered at the College by the Professors on subjects connected with their respective departments, and daily clinics will be delivered at the Hospital or the Dispensary by one or other member of the Faculty.

FEES.

Fees for a Full Course of Lectures,	$105
Fee for the Diploma,	20
" " admission to the Dissecting Rooms and the Demonstrations,	10
Matriculation Fee,	5

Comfortable Boarding can be obtained within a short distance of the College, for from two to three dollars per week.

Students and others desirous of further information, will please address the Dean of the Faculty.

Requisites for Graduation.

It is required of the Candidate for the Degree of Doctor of Medicine:

1. That he be of lawful age, and of good moral character.

2. That he shall have attended two full courses of Lectures in some respectable Medical School, one of which shall have been in this College; and he must exhibit his tickets, or other adequate evidence thereof, to the Dean of the Faculty.

3. The candidate must have studied Medicine for not less than three years (the terms of attending Lectures being included in these,) under the direction of a respectable medical practitioner.

4. A Practitioner of Medicine, in order to his becoming a Candidate, must exhibit testimony to the Faculty of his having been engaged in a reputable practice during the three years preceding his application; and he must, also, have attended one full course of lectures in this Institution.

5. Candidates for Graduation must present to the Dean of the Faculty an acceptable thesis on some medical subject, correctly written, either in the English, Latin, or French Language; and they must, also, exhibit to the Faculty, at their examinations, satisfactory evidences of their professional attainments.

6. They must, also, notify the Dean, in writing, of their intention to become candidates by the first of February; their Thesis and Graduation Fee must be presented at that time, both of which shall be returned in case of withdrawal or rejection.

Application for the *ad eundem* degree must be accompanied by written evidence that the candidate is a graduate of an accredited School of Medicine; that he has been engaged, for the year preceding his application, in the Practice of Medicine; and, also, that he sustains a good moral character, and intends to devote his time wholly to the practice of his profession.

JOS. N. McDOWELL, M. D.,
Dean of the Med. Faculty.

List of Medical Students,

SESSION 1853–4.

NAMES.	RESIDENCE.	PRECEPTOR.
Adams, John, M. D.,	Mo.	
Alexander, W. A.,	Ind.	Dr. J. Ellis.
Asbury, Isham R.,	Mo.	" P. T. Dimmitt.
Bainbridge, M.,	Ky.	Prof. J. N. McDowell.
Baker, Hugh R., M. D.,	Mo.	
Baker, J.,	"	Practitioner.
Barber, D. C.,	"	"
Barnes, Algernon, S.	"	Prof. John Barnes.
Barrett, Richard A.,	"	Dr. R. T. Barrett.
Bassett, E. H.,	Ark.	" John W. Bent.
Bateman, Ebenezer B.,	Cal.	Practitioner.
Bell, J. W.,	Ky.	Dr. Hall.
Bender Samuel,		Practitioner.
Blanks, J. G.,	Mo.	Dr. L. T. Pim.
Boal, G. M.,	Ill.	Practitioner.
Brooks, Thomas,	Mo.	Practitioner.
Brown, Joseph T.,	"	Prof. John S. Moore.
Bryan, Edward, M. D.,	"	
Bryan, J. Gano, Jr.,	"	Dr. J. G. Bryan.
Bucker, Robert S.,	Texas.	Dr. Marcellus Cunningham.
Bullock, R. L.,	"	Practitioner.
Campell, Dr.,	Mo.	Prof. John Barnes.
Crawford, J. L.,	Ill.	Dr. John Marsh.
Cooper, James S.,	"	" M. A. Cooper.
Cowan, James,	Ky.	Dr. F. Cowan.
Dewey, G. H.,	Ill.	" John S. Dewey.
Dobyns, J. T.,	Mo.	" R. F. Dobyns.
Dorrell, Washington,	"	Practitioner.
Douglass, James R.,	"	Dr. B. F. Todd.
Duncan, Thomas M.,	Texas.	" W. Fisher.
Eppler, George,	Saxony.	" Weber.

NAMES.	RESIDENCE.	PRECEPTOR.
Fackler, Wm. H.,	Mo.	Prof. J. S. Moore.
Gaskill, James R. M.,	Ill.	Practitioner.
Gilkey, C. M.,	Ohio.	"
Glover, Walter S.,	Mo.	Dr. Wm. Bottin.
Glover, W. R.,	Ill.	Drs. Tull & Atwood.
Goran, A. D., M. D.,	Mo.	
Gorham, M. R.,	"	Dr. Fort.
Grubb, A. O.,	"	Practitioner.
Hall, James,	"	Prof. P. Spence.
Harney, James M.,	"	" J. S. Moore.
Harper, Warwick,	Ill.	Practitioner.
Harrison James, M. D.,	Mo.	
Hatler, M.,	"	Dr. W. R. Mathews.
Henderson John,	Tenn.	" W. Hendorson.
Herndon, G. P.,	Mo.	" Peter Austin.
Henry, John,	"	" E. Fraser.
Henry, W. E.,	"	Practitioner.
Higgins, John,	Ark.	Dr. Andrew Redford.
Holmes, Aaron	Ky.	" H. Livermore.
Hopton, John,	Mo.	Prof. A. Hopton.
Hubbard, Moses.	"	Dr. C. Wright.
Hughes, R. F.,	"	" Staples.
January, J. A.,	"	Practitioner.
Jennings, P S.,	"	"
Jones, Thomas J.	"	"
Jones, S. P.,	"	Dr. D. R. Jones.
Kavanaugh, T.,	"	Prof. B. T. Kavanaugh.
Kirby, B. F.,	"	Dr Samuel Bender.
Kersting, F. W.,	Ill.	Practitioner.
Koch, Albert, Sr., M. D.,	Germany.	
Koch, Albert, Jr.,	"	Dr. Albert Koch.
Lackland, Antony,	Mo.	" Allen McClure.
Larkin, Thomas,	Miss.	" G. H. Gibbs.
Leads, J., M. D.,	Ill.	
Lemmon, W.,	Mo.	Dr. W. R. Mathews.
Lindsey, J. A.,	"	Practitioner.
Long, George H.,	Ill.	Prof. J. T. Hodgen.

NAMES.	RESIDENCE.	PRECEPTOR.
Long, Henry,	Miss.	Dr. B. T. Kelley.
Machett, M.,	Mo.	Prof. J. N. McDowell.
Mathews, M. R.,	Ill.	Dr. Moran.
Matson, R. A., M. D.,	Mo.	
Maughs, Thomas,	"	Dr. M. M. Maughs.
Maupin, Wm. B.,	"	Practitioner.
McCall, S.,	"	Dr. G. W. Raggin.
McDowell, John J.	"	Prof. J. N. McDowell.
Moore, John C.,	"	" John S. Moore.
Murphy, John S.,	"	Dr. J. H. Hall.
Overton, D. H,	"	Prof. J. T. Hodgen.
Patrick, John,	Ill.	Practitioner.
Perryman, J. L.,	"	Dr. J. A. & W. Roman.
Powell, A. J.,	Ind.	" L. Rothwell.
Rawlings, J. J.,	"	Practitioner.
Riggin, G. W.,	Ill.	"
Robinson, J. A.	Mo.	Dr. G. F. Grant.
Ross, Charles, M. D.,	"	
Sales, J., M. D.,	"	
Samuel, G. G.,	"	Practitioner.
Scanland, Richard.	Ill.	Dr. E. M. Lealy.
Schrader, Otto Von, M. D.,	"	
Scott, I. T.,	Mo.	" John A. Tulley.
Shasted, Thos. S.,	Ill.	Drs. Campell & Hodgen.
Slater, C. P.,	"	Practitioner.
Sparks, S. C.,	"	"
Spires, Charles,	Mo.	"
Stevenson, M. D.,	"	
Stewart, Robert,	"	Prof. J. N. McDowell.
Stewart, C. Jackson,	Ill.	
Stoner, E. R.,	"	Practitioner.
Tedford, John C.,	Mo.	"
Thomas, John L.,	"	Dr. J. H. Hall.
Thompkins, Junius,	"	" H. F. Hughes.
Thorpe, A. V.,	Ill.	" A. P. Stoner.
Torrey, M. D.,	"	
Turner, C. F.,	Mo.	Practitioner.

NAMES.	RESIDENCE.	PRECEPTOR.
Van Horne, Augustus R.,	Ill.	Dr. Chas. A. Knapp.
Watson, C. A.,	"	" M. Mellburn.
White, B. F.,	Tenn.	" J. Jenkins.
Wills, Lewis,	Mo.	Practitioner.
Winfrey, W. H.,	"	Drs. Tull & Atwood.
Woodson, John,	Ill.	Prof. J. S. Moore.
Yenger, Simeon A.,	La.	Practitioner.
Young, Charles L.,	Mo.	Prof. J. N. McDowell.

Total, 113.

1854

List of Graduates.

NAMES.	RESIDENCE.	SUBJECT OF THESIS.
Asbury, Isham R.,	Mo.	Hygiene.
Bateman, Ebenezer B.,	Cal.	Pleurisy.
Barret, Richard A.,	Mo.	Sulphate of Quinine, its Therapeutical Application.
Bell, Joseph W.,	Ky.	The Membranes.
Bender, Samuel,		Pathology of Tetanus.
Boal, George M.,	Ill.	Cholera.
Bullock, Randolph L.,	Texas.	Pneumonia.
Blanks, John G.,	Mo.	Typhus Fever.
Bryan, John G.,	"	Pathology of Inflammation.
Brown, Joseph T.,	"	Dysentery.
Crawford, Josiah J.,	Ill.	Inguinal Hernia.
Dewey, George H.,	"	Symptomatology.
Dobyns, John T.,	Mo.	Sulphate of Quinine.
Dorrell, Washington,	"	Uterine Hemorrhage.
Gaskill, James R. M.,	Ill.	Progress of Medicine.
Gilkey, Charles M.,	Ohio.	Bilious Pneumonia.
Henry, William E.,	Mo.	Contagion.
Herndon, Grief P.,	"	Pneumonia.
Hughes. Benjamin F.,	"	Tetanus.

NAMES.	RESIDENCE.	SUBJECT OF THESIS.
Jones, Thomas J.,	Mo.	Erysipelas.
Jones, Solomon P.,	"	Inflammation.
Kavanaugh, Thomas H.,	"	Physiology and Pathology of the Blood.
Kirby, Benjamin F.,	"	Malaria.
Lindsey, James A.,	"	Inguinal Hernia.
Overton, Dudley H.,	"	Menstruation.
Perryman, James L.,	Ill.	Pathological Investigations.
Rawlings, John J.,	Ind.	Complications of Disease.
Scott, James T.,	Mo.	Scrofula.
Slater, C. P.,	Ill.	Evil Effects of Tight Lacing.
Stoner, Eben R.,	"	Mercurial Ptyalism.
Turner, Carolus F.,	Mo.	Life.
Wills, Lewis,	"	Cinchona and its preparations.
Yeager, Simeon A.,	La.	Chloroform.
Young, Charles L.,	Mo.	Puerperal Peritonitis.

AD EUNDUM DEGREE.

Anderson, Charles L.,	Ill.
Baker, Hugh R,	Mo.
Batson, Andrew J.,	Ind.
Hard, Chester,	"
Mayo, William W.,	"

HONORARY DEGREE.

Watkins, John, Ark.

LITERARY DEPARTMENT OF THE MISSOURI UNIVERSITY.

The University of the State of Missouri was chartered by the Legislature during the session of 1838–'9, and went into full operation under its present organization on the first of January, 1844; since which time it has been in successful operation, affording to students the educational advantages ordinarily enjoyed in similar institutions.

The University edifice, is a spacious, tasteful and commodious building; was erected at an expense of about $85,000, by the liberality of the citizens of the county of Boone, in which it is located.

The annual revenue of the Institution, exclusive of fees for Tuition, is the income of a State fund of $100,000, being the proceeds of the sales of lands, donated by Congress to the State for University purposes. The principal is well invested and is legally inviolable.

Columbia, the seat of the University, is situated near the centre of the State, ten miles north of Providence on the Missouri river. The town contains abont twelve hundred inhabitants. It is confidently believed that no location combines more advantages for the site of a Literary Institution. It is not surpassed in healthiness; and in those social, moral and religious influences which are conservative of the character of young men, and promotive of good order and industrious habits of study.

The University is easily accessible by the river during the greater part of the year. At the landing in Providence, carriages will always be in atiendance to convey passengers to Columbia. To this point a plank road is expected to be built in the next twelve months. There is also constant communication with St. Louis and with the upper counties by stage.

Should farther information be desired by parents or guardians, it may be obtained by addressing the President of the University or any of the Professors.


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LOUIS